BreezeACCESS VL

BreezeACCESS VL Version 3.0

Release Notes

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1. Introduction

BreezeACCESS VL version 3.0 includes new HW (HW Revision C) and SW. It introduces new features and some problem fixes. A new product (SU-E-BS) is also introduced.

2. Frequency bands

The currently supported frequency bands:

- 5.725 – 5.850 GHz (5.8 band, FCC)
- 5.470 – 5.725 GHz (5.4 band, ETSI)
- 5.150 – 5.350 GHz (5.2 band)
- 5.250 – 5.350 (5.3 band, FCC)
- 5.03 – 5.091 GHz (4.9 band, will be extended in the future to include the 4.9 – 5.0 GHz range)

3. New Features

Concatenation Mechanism for Increased Capacity

The Concatenation mechanism enables bundling two data frames into a single frame for transmission to the wireless link. This feature reduces the overhead in the wireless media and improves significantly the achievable throughput (for units with HW revision C throughput can be increased from 20 Mbps to 25Mbps for FTP, from 30Mbps to 40Mbps for UDP). When concatenation is enabled, data packets in the queue of the internal bridge can be accumulated before the concatenated frame is transmitted to the wireless media. Two data frames can be accumulated, up to a maximum of 3400 bytes in units with HW revision C or 2200 bytes in units with HW revision B or lower. In the AU, the concatenation process is performed separately for each destination SU.

New Tx and Rx counters were added to indicate the number of transmitted/received concatenated frames.

To support the concatenation feature, the upper limit of the RTS Threshold parameter has been changed to 3400. The default value of the RTS Threshold parameter in AU has been changed to 3400 (No RTS/CTS). When upgrading from a previous version, the RTS Threshold in AU is forced to 3400.

Burst Mode operation with DFS/Data Encryption

Improved performance and higher throughput are now available for AUs with HW Revision C that use DFS, since Burst Mode can now be enabled for these AUs (previously Burst Mode was blocked in AUs when DFS was used). Burst Mode can also be enabled in SUs with HW Revision C that use data encryption (previously Burst Mode was blocked in SUs when data encryption was used).

10 MHz Bandwidth Support

Channels with a bandwidth of 10 MHz are supported by units with HW Revision C. This capability provides a much higher number of available channels, facilitating better radio planning. The actually available bandwidth depends on the applicable Country Code. HW revision C supports also better channels resolution using 5 MHz steps.

To prevent possible loss of connectivity, a Sub Band using a 10 MHz bandwidth can be selected in an SU only if the associated AU has HW Revision C that can support this bandwidth.

DFS+: DFS Algorithm Improvement through Channel Reuse

Typically, operators prefer to preserve the original frequency planning and to avoid moving to a new channel unless they are sure that there is a continuous radar activity in the original channel. It should be noted that detection of radar activity does not necessarily indicate a continuous radar activity in the channel. The channel reuse algorithm enables returning to the original channel under certain conditions that indicates low radar activity in the channel.

ACCS (Automatic Clear Channel Selection) - Efficient Spectrum Analysis and automatic channel selection.

The Spectrum Analysis feature enables gaining knowledge of the noise characteristics per channel. This enables construction of a relatively noise free working environment. When the Spectrum Analysis feature is activated, the unit will enter passive scanning mode for a definite period, during which information shall be gathered. The scanned channels will be the channels comprising the selected sub set.

Upon activating the spectrum analysis the unit will automatically reset. During the information-gathering period the unit will not receive nor transmit data. It also will not be able to synchronize/associate, meaning that it cannot be managed via the wireless link. At the end of the period the unit will reset automatically regaining normal operability upon start up. During normal operation the administrator can view the results of the last spectrum analysis.

The administrator may configure the AU to analyze the spectrum analysis results and automatically configure itself to use the first most noise free channel.

Improved Performance in Links with a Low SNR

In links with a low SNR (below 13), the multirate algorithm may not stabilize on the correct rate when using the standard decision thresholds. In this case the algorithm may try to use a rate that is too high, resulting in a relatively large number of dropped frames. The "High Decision Thresholds" option in the Multirate Parameters solves this limitation and ensures good performance also in links with a low SNR.

DHCP Unicast Override Filter

When user filtering is activated, unicast DHCP messages are filtered out (unless the address of the subnet that the DHCP server will assign is configured as a part of the User Filtering Addresses). Therefore the unit shall not receive an IP from the DHCP server. In order to avoid such a situation a new parameter was added to enable/disable the option to filter unicast DHCP messages, overriding the general user filtering mechanism.

New Diagnostics Features

Last Reset Reason

Upon start up, the reason for the last reset is saved in the log file, at warning level (Supported only by HW revision C).

Continuous Uplink Quality Indicator Display

This indicator serves as an additional support tool during installation and maintenance of SUs, enabling to evaluate the quality of the link to the AU. The Link Quality Indicator (LQI) reflects the current Average Modulation Level (AML). The average will be dynamically updated and displayed – meaning that it is calculated taking into account the history of the last few seconds. Each successful transmission will be included in the average, which is rounded to the nearest integer.

Improved Per Modulation Level Counters Display

In SUs, in addition to the SUCCESS/FAIL counts per modulation level, the Average Modulation Level (AML) is also displayed. This is the average modulation level of successful

transmissions (rounded to the nearest integer) since the last time the Per Modulation Level counters were reset.

SU's Age Display in AU's MAC Address Data Base

Aging-out is not implemented in the Association database. To provide an age indication, the age of each SU is added to the Association Info display, where the age is defined as the elapsed time since receiving the last packet from the SU.

Full Factory Default Setting Via IDU

In units with ODU HW revision C and an IDU PS 1073 (black IDU), the RESET button can be used for setting the unit to its factory defaults (this feature is not supported by the older IDU PS 1036). The button should be pressed for at least 5 seconds (until the ETH LED of the IDU stops blinking): the unit will reboot with the factory default configuration.

Link Capabilities Exchange

The Link Capability option provides information on HW and SW capabilities of relevant units, based on information exchange during the association process. When the Best AU option is enabled, SUs also collect information from all AUs found during the scanning process. In an AU, the information provided in the Link Capability reports is for all associated SUs. In an SU, the Link Capability reports include information on all AUs in the neighboring AUs table (all AUs with whom the SU can communicate).

The Link Capability feature enables to adapt the configuration of the unit according to the capabilities of other relevant unit(s) to ensure optimal operation.

AU Tx Control

The Tx Control option enables turning Off/On the AU's transmitter. This feature can be used during maintenance or testing to avoid transmissions using undesired parameters. The feature is available only from the Ethernet port. Note that the unit is reset automatically upon configuration of the parameter.

Disassociating SUs

The Disassociation feature in the AU enables disassociating all or selected SUs. This feature is useful during configuration changes, enabling to force the SU(s) to re-initiate the association process, including the search for the best AU (or a preferred AU) using the Best AU process, without performing a full reset.

4. New Products

The SU-E-BS is a special variant of a Subscriber Unit, where the indoor unit is designed for installation in the Base station chassis (similar to the AU-IDU). The outdoor unit is an SU-E-ODU, with a connection to an external antenna.

The SU-E-BS is intended primarily for point-to-point or point-to-few points backhauling or similar applications, including applications where it is used in conjunction with a GFSK-based system.

5. Documentation

The information in the release notes is complementary to the product documentation, provided with the products. BreezeACCESS VL documentation includes system manual and release notes. The system manual covers all relevant topics associated with the BreezeACCESS VL base station and subscriber unit equipment. The latest release notes is available in the customer service section of the Alvarion web site.

6. Compatibility and Interoperability

Version 3.0 is fully compatible with versions 1.2 and 2.0. Nevertheless, it is recommended to always upgrade existing equipment to the latest version.

HW Revision C is compatible with HW Revision B. If an SU with HW B is used in a cell where the AU is with HW C (or vice versa), performance will be those available with HW Revision B.

The SW package will be available in the customer service section of the Alvarion web site.

7. Important Notes

- BA VL plugged-in AUs (AU-BS) works only with BS-SH-VL chassis, and requires a VL power supply (BS-PS-AC-VL). BS-SH-VL chassis can be identified by a label on the chassis' s flange arms.

- In case the MAC address and S/N stickers are not found on the IDU two sets of MAC and S/N stickers are provided attached to the ODU. Stick one set on the bottom of the IDU and save the spare set for future use in RMA cases. (Please refer to SU quick installation guide for a diagram)

- BS-SH-VL chassis can host all GFSK (3Mbps) products at all frequencies. GFSK & VL AUs can co-exist on the same chassis, however they need a different power supply (BS-PS-AC for GFSK and BS-PS -AC-VL for VL.

- The system provides TFTP functionality for SW and configuration download. In case FTP functionality is required, an additional IP address is required for the FTP client. In addition, FTP parameters change requires reset. Note: The FTP frames are not handled as management frames and are not affected by VLAN management and management filtering.

- Although minimum output power is defined as -10 dB when configuring the Tx Power manually, when ATPC is enabled the SU's output power may be less than this minimum.

- Extra care should be taken when configuring VLAN management and management IP filtering in order not to lose connectivity with unit. In case of connectivity loss, use the "restore default parameters" application to reset to factory values.

- In case data encryption is used, the maximum number of SUs that can be served by an AU is limited to 124 (512 when data encryption is not used. Note than when data encryption is neede, it must be used by all SUs served by the same AU, as well as by the AU itself).

- The system was checked with SNMPC version 5.1.11e.

8. Limitations & Known Issues

- Sensitivity may change slightly as a function of frequency (+/-2dB).

- The prioritization mechanism is disabled when the traffic rate reaches the maximum information rate supported by the SU.

- On 4.9 GHz products, transmission power accuracy is of 1 dB when above 0 dBm @ antenna port (typical condition). Readings may be incorrect below this range, never contradicting regulations.

- On 5.2 GHz products, transmission power accuracy is of 1 dB when above 8dBm @ antenna port (typical condition). Readings may be incorrect below 8dBm, never contradicting regulations.

- In units operating in the 5.3 GHz band, the following rules must be met for full compliance with FCC regulations:

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a. Frequency channel 5260 MHz should not be used

b. When operating at 5270 MHz, the Transmit Power parameter in the AU, and the Maximum Tx Power parameter in the SUs served by this AU, should not be set to a value above "17-Antenna Gain" (The maximum allowed EIRP for 5270 MHz is 17 dBm).

- The accuracy of the Transmit Power level is typically +/- 1 dB. However, at levels that are 15 dB or more below the maximum supported by the hardware, the accuracy is +/- 3 dB (for information on hardware limitations refer to the Country Codes document). At these levels the use of ATPC may cause significant fluctuations in the power level of the transmitted signal. When operating at such low levels, it is recommended to disable the ATPC Option in the SU and to set the Transmit Power parameter to the average Tx Power level before the ATPC was disabled.

- It is not possible to configure FTP Client IP address with the same value as the unit's IP address. Attempting to do so will display an error when telnet is used and no error will be raised when SNMP (BreezeCONFIG) is used. Note that the FTP settings are not reverted to defaults upon issuing a "Set Full Operator defaults" command (they do revert to default after executing "Set Full Factory Defaults").

- The maximum number of SUs that can be served by an AU when Data Encryption is enabled is 124. The number displayed for the Maximum Number of Associations is the value configured for this parameter, which might be higher than the actual limit, indicated in the Show Air Interface Parameters display.

- In units with HW Revision B, Burst Mode cannot be activated when using WEP for data encryption. In units with HW Revision B, the Burst Mode option will be "blocked" upon trying to enable it when using WEP for data encryption. This limitation does not apply to units with HW Revision C.

- The Country Code Learning by SU feature does not function with the default ESSID (ESSID1).

9. Fixed Issues

- In country code parameters screen, with country code where the EIRP is not limited by regulations, such as in SUs with country code 1020 (FCC regulation), the indicated "Max

EIRP" value was 100dBm, meaning that practically there is no limit. In version 3.0 it displays "No Limit".

- In AU with HW Revision B or lower, Burst Mode Option is "blocked" when DFS Option is enabled. In units with HW Revision C Burst Mode may be enabled when DFS is used.

- In units with HW revision B or lower, Burst Mode Option is "blocked" when Data Encryption using WEP is enabled. In units with HW Revision C Burst Mode may be enabled when WEP data encryption is used.

- It was not possible to use the DHCP Client feature (Enabled or Automatic) with User IP Filtering, unless the IP address or the Subnet that the DHCP will assign is configured as part of the User IP Filtering addresses. This limitation is now solved with the DHCP Unicast Override Filter parameter.

- In previous versions, upon requesting "Reset and Run From Shadow" the unit was reset even if there was no Shadow version. This problem was solved and no action will take place upon trying to perform "Reset and Run From Shadow" when a Shadow version does not exist.

- FTP parameters are set to their factory default values upon requesting Set Full Factory Defaults. Note that these parameters are set to their default values immediately upon selecting the Set Full Factory Defaults option (not after reset). These parameters do not revert to defaults after execution of a Set Full Operator Defaults operation.

- The Per Modulation Level Counters option was previously available only under Administrator access rights. Now it is available also under Installer access rights.

- Upon upgrading to SW Version 2.0 from a lower version with the SW Retry Option enabled, the SW Retry algorithm was enabled, blocking the activation of the Burst Mode Option. This limitation was eliminated, and the SW Retry algorithm is never enabled, regardless of the configuration of the SW Retry parameters before the upgrade.

- In previous versions, it was observed that after a few days of system operation when the Cell Distance is set to Automatic, some SUs no longer learn the distance from the AU. In such a case the SU may use inappropriate slot time and acknowledge timeout, leading to link throughput degradation (retransmissions and drops). This problem could previously be solved

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only by setting the Cell Distance manually. In SW version 3.0 this problem has been solved and the Automatic Cell Distance may be used without any limitations.

- In some previous versions, it was found out that not all SNMP applications succeeded to compile the MIB file correctly. This was a result of the wrong location of two object identifiers in the MIB. To fix this, it was needed to move these two lines to a different location in the MIB file. This problem was corrected.

- In previous version the values of the MIB II ifInOctets and ifOutOctets counters of the wireless link interface were incorrect. This problem was solved.